# Epidemiology of *Salmonella* in two different finishing swine barns in Brazil

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**Abstract:** Many finishing barns in Brazil have "lâmina d'água", a continuous water flow at the back of solid-floored adjacent pens. Prevalence of *Salmonella* shedding and environmental contamination in finishing barns with "lâmina d'água" and without it were assessed through a cross sectional study conducted in 6 farms. No difference was found between the two systems. Sixteen *Salmonella* strains were isolated from 4 farms, comprising 6 serotypes: *S.* Agona, *S.* Typhimurium, *S.* Senftenberg, *S.* Sandiego, *S.* Rissen and *S.* Javiana. Serotypes varied among farms and differed from those recently identified in Brazil. Epidemiology of *Salmonella* in swine farms is complex and might vary between farms or even between barns in a same farm.

**Keywords:** epidemiology, hogs, "lâmina d'água", prevalence, water

**Introduction:** The implementation of efficient control measures to reduce *Salmonella* prevalence on farms is very difficult given the lack of knowledge about the epidemiology of this organism in modern swine raising systems. Some epidemiological researches have been conducted focusing on possible risk factors associated to *Salmonella* dissemination. Higher *Salmonella* prevalence has been shown in finishing barns provided with open flush gutters system compared to finishing barns with slotted floors (Davies et al., 1997 b). Many finishing barns in Brazil have "lâmina d'água", a continuous water flow at the back of solid-floored adjacent pens. The water of the "lâmina d'água" is shared by many pens what leads to the interchange of fecal material among them. The goal of this study was to evaluate the influence of this system on the *Salmonella* shedding and contamination in swine finishing barns.

**Material and Methods:** A cross sectional study was conducted in 6 farms that had both kinds of finishing barns, with "lâmina d'água" (WL) and without "lâmina d'água" (NL). From each barn, 36 pigs were sampled, considering 10% accuracy at the 95% confidence level and an estimated prevalence of 10%. Water from the "lâmina d'água" and drinkers, and pool of feces from floors were collected. Feed

samples were collected before entering the barn. Bacteriological procedures were carried out according to Davies et al. (1997 a) for feces and feed samples and Henry et al. (1995) for water samples. Data were analyzed by the Wilcoxon Signed Rank Test for paired observations. Biosecurity management of barns was also evaluated by an open-ended questionnaire and analyzed by Cluster Analysis.

**Results and Discussion:** No difference ($P>0.05$) was found between NL and WL systems regarding the occurrence of *Salmonella* (1.99 and 1.14%, respectively). Table 1 shows the number of *Salmonella* isolations in each farm. The serotype profiles varied between farms (Figure 1) and differed from those recently identified in Brazil, except for *Salmonella* Agona,. This serotype is probably one of the most important in swine production in Brazil given its frequent isolation in epidemiological studies and the relative relevance as human salmonellosis agent. The isolation of *Salmonella* Agona from water samples collected from "lâmina d'água" may indicate a possible role of liquids on the persistence of this serotype in a barn, since this serotype has been isolated frequently from studies involving flushed animal effluents and recycled water utilization in animal production. *S.*Typhimurium was isolated from a cleaned and disinfected feeder in a barn from which no *Salmonella* had been isolated before. This may enforce the importance of vectors on *Salmonella* dissemination. The finishing environment can constitute an important source of *Salmonella* as a result of internal cycles of contamination. Cluster analysis resulted in two groups of barns. The group of barns with less biosecurity procedures showed the higher number of positive samples. Epidemiology of *Salmonella* in swine farms might vary even between barns in a same farm and results indicated that biosecurity measures are important in the control of *Salmonella* dissemination. Possible risk factors must be individually assessed and conclusions carefully taken.

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**References:**

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**Table 1.** Number of *Salmonella* positive samples collected from the six test farms considering their different origin. (positive samples/total collected samples)

| Sample | Farm | | | | | | |
|---|---|---|---|---|---|---|---|
| | *A* | *B* | *C* | *D* | *E* | *F* | Total |
| **Individual feces** | 4/72 | 1/72 | 0/112 | 3/88 | 0/90 | 0/88 | 8/522 (1.53%) |
| **Feed** | 1/34 | 0/34 | 0/34 | 0/34 | 0/34 | 0/34 | 1/204 (0.49%) |
| **Pool of feces** | 2/14 | 0/14 | 0/14 | 1/14 | 0/14 | 0/14 | 3/84 (5.5%) |
| **Water/WL system** | 2/9 | 0/8 | 0/12 | 0/8 | 0/8 | 0/6 | 2/51 (3.92%) |
| **Floor swabs** | 0/11 | 0/5 | 0/12 | 0/9 | 0/16 | 0/10 | 0/63 (0,0%) |
| **Feeder swabs** | 0/8 | 0/4 | 0/12 | 0/9 | 1/16 | 0/10 | 1/59 (1.69%) |
| **Drink water** | 1/7 | 0/4 | 0/8 | 0/8 | 0/8 | 0/8 | 1/43 (2.32%) |
| **Total** | **10/155** | **1/141** | **0/204** | **4/170** | **1/186** | **0/170** | **16/1026** |
| | **6.45%** | **0.71%** | **0%** | **2.35%** | **0.53%** | **0%** | **1.56%** |

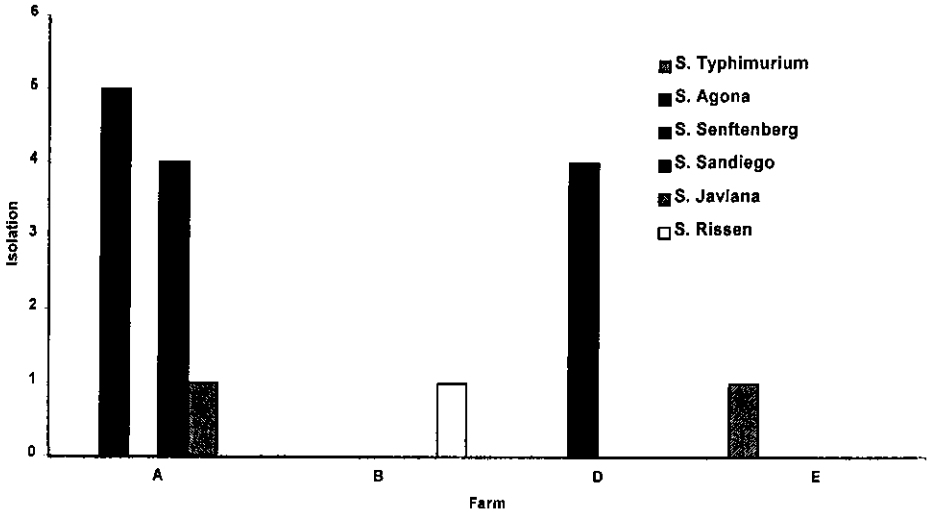


**Figura 1.** Number of *Salmonella* serotypes isolated in different test farms